R E P O R T R E S U M E S

ED 020 622 EF 000 483

A FACULTY OFFICE STUDY. DESIGN AND EVALUATION.

BY- CARPENTER, C.R. AND OTHERS
PENNSYLVANIA STATE UNIV., UNIVERSITY PARK

PUB DATE DEC 61

EDRS PRICE MF-$0.25 HC-$1.00 23P.

DESCRIPTORS- *BUILDING DESIGN, CONSTRUCTION NEEDS, DESIGN NEEDS, FACILITY CASE STUDIES, FACILITY GUIDELINES, HIGH EDUCATION, MODELS, OFFICES (FACILITIES),

ASSUMING THAT ADEQUATE OFFICES FOR SERVING THE NEEDS OF FACULTY AND STAFF MEMBERS SHOULD BE PLANNED AND CONSTRUCTED AS INTEGRAL PARTS OF FACILITIES, RESEARCH WAS CONDUCTED AND RESULTS REPORTED ON THE DESIGN OF A TWO-PERSON FACULTY AND/OR STAFF OFFICE. A FULL SCALE, PROTOTYPE MODEL WAS DEVELOPED FOR THE TWO-PERSON OFFICE AND TESTED FOR ECONOMICAL EFFECTIVENESS, POSSIBLE COMBINATIONS WITH OTHER OFFICE SPACES AND RELATED FACILITIES. OFFICE LOCATION, SPATIAL ARRANGEMENTS FOR STAFF OFFICES, AND OTHER SUBJECTS ARE DISCUSSED PRIOR TO PRESENTING THE RESEARCH RESULTS. THE EXPERIMENTAL METHOD, PROTOTYPE MODEL, SOLUTIONS, AND THE TEST RESULTS ARE DESCRIBED. COMMUNICATION EFFICIENCY, CIRCULATION PATTERNS, AND CONSTRUCTION DESIGN ARE EVALUATED FROM THE BASIC MODEL AS ARE SIMILAR OFFICE MODULES TO TEST FLEXIBILITY, EXPANDIBILITY, AND CONVERTABILITY. THE APPENDICES CONTAIN THE QUESTIONNAIRE FORM AND STATEMENTS FROM FACULTY INTERVIEWS USED IN THE EVALUATION PROCEDURE. THE IDEA OF PROVIDING A FULL-SCALE MODEL OF SEVERAL OF THE PROPOSED OFFICES AND EVALUATING THEM PRIOR TO DESIGN FOR PERMANENT BUILDINGS IS A TECHNIQUE WHICH WOULD APPEAR TO BE APPROPRIATE FOR THE SOLUTION OF A NUMBER OF PROBLEMS WHICH CONFRONT DESIGNERS OF EDUCATIONAL FACILITIES. (BH)

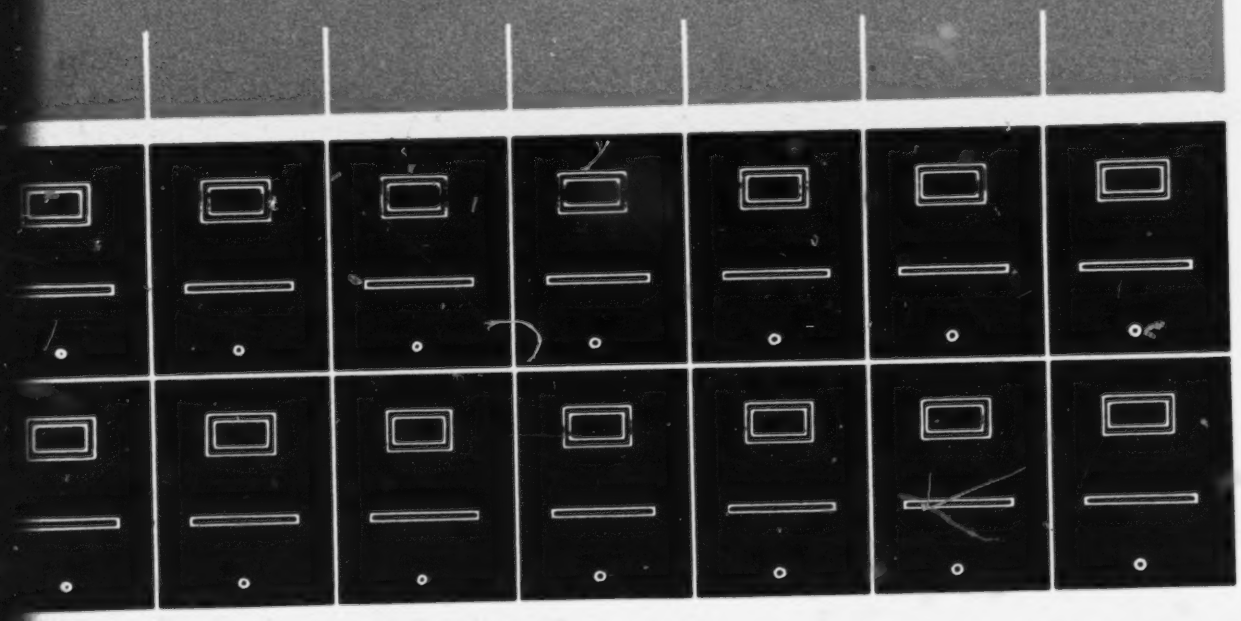
ED 020622

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

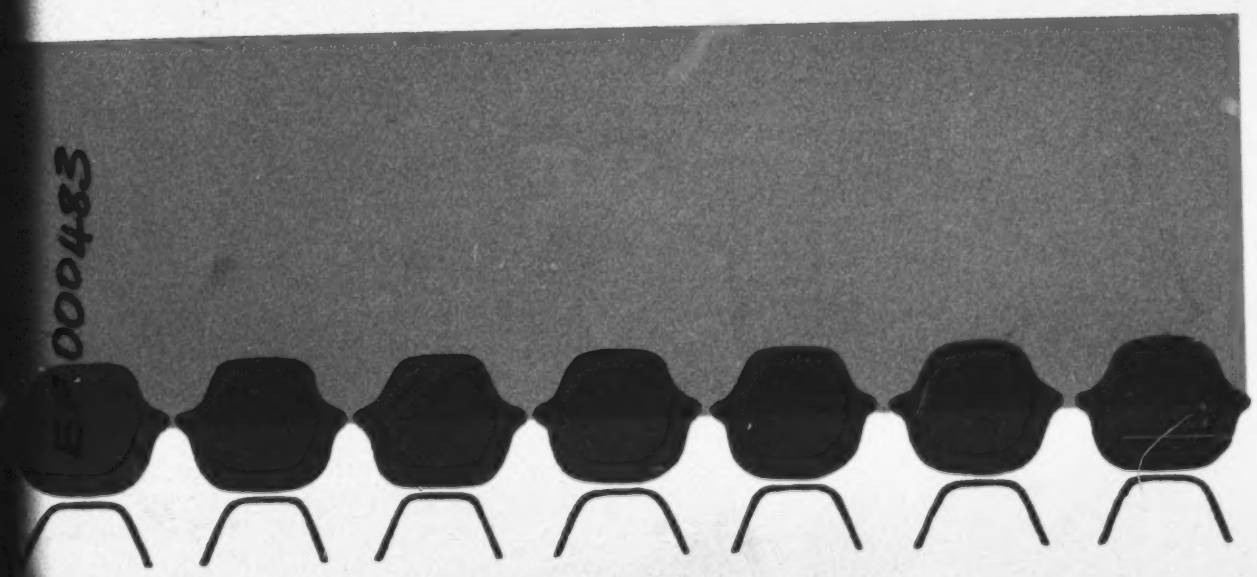
A FACULTY OFFICE STUDY: DESIGN AND EVALUATION

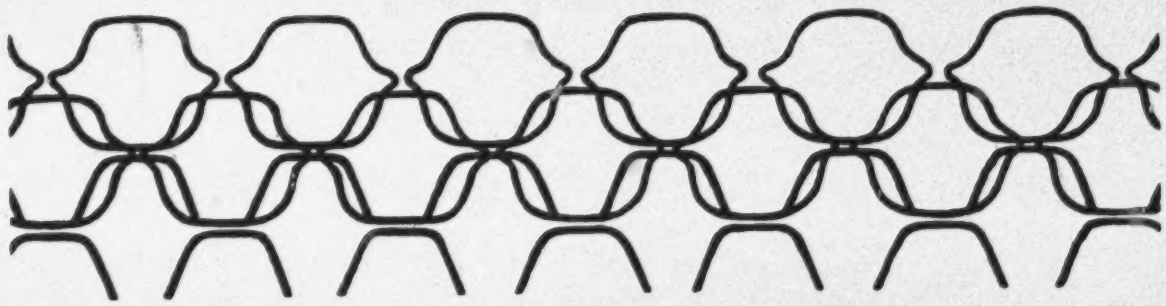
BY THE DIVISION OF ACADEMIC RESEARCH AND SERVICES
AND THE DEPARTMENT OF PHYSICAL PLANT PLANNING AND CONSTRUCTION
THE PENNSYLVANIA STATE UNIVERSITY



AN EDUCATIONAL FACILITIES LABORATORIES PROJECT REPORT

ED 000483





A FACULTY OFFICE STUDY: DESIGN AND EVALUATION

BY

C. R. CARPENTER

L. P. GREENHILL

R. E. SPENCER

W. H. WIEGAND

J. D. MILLER

J. M. CARTEY

A. R. BIGATEL

DIVISION OF ACADEMIC RESEARCH AND SERVICES
AND
DEPARTMENT OF PHYSICAL PLANT PLANNING AND CONSTRUCTION

THE PENNSYLVANIA STATE UNIVERSITY, UNIVERSITY PARK, PENNSYLVANIA

DECEMBER 1961

Supported by a grant from the Educational Facilities Laboratories, Inc.
477 Madison Avenue, New York 22, New York

ACKNOWLEDGMENTS

The Department of Physical Plant Planning and Construction and the Division of Academic Research and Services of The Pennsylvania State University wish to express their appreciation to the following persons who assisted in the project:

Furniture supplied by: J. Wilkinson, Bellefonte, Pa.

Furniture loaned by: Otto Mueller, Housing Division, The Pennsylvania State University

Photographs by: J. Mertz, Still Photography Laboratory, The Pennsylvania State University

The architecture class of Robert Napier, The Pennsylvania State University, contributed color studies and small-scale models of the faculty offices prior to actual mock-up construction.

The Department of Maintenance and Utilities built the mock-up rooms.

The Pennsylvania State University would also like to express appreciation to The Educational Facilities Laboratories, Inc., for the grant which made this study possible.

Table of Contents

		Page
Foreword	. . . . .	1
I - The Problem	. . . . .	2
II - An Experimental Solution	. . . . .	4
III - Construction Design	. . . . .	9
IV - Evaluation	. . . . .	13
APPENDIX I - Evaluation Sheet		
APPENDIX II - Reactions of Faculty Members		

Table of Illustrations

		Page
Figure 1 -	An ample private office 10′ x 12′	2a
Figure 2 -	A 10′ x 10′ office	2b
Figure 3 -	A 10′ x 10′ private office plan with interoffice connecting doors	3a
Figure 4 -	A "bull pen" office	3b
Figure 5 -	The typical deep office sandwiched between classrooms or laboratories	3c
Figure 6 -	The layout of the experimental two-man office	5a
Figure 7 -	The floor plan of the full-scale model built and evaluated at The Pennsylvania State University	5b
Figure 8 and Figure 9 -	Other variations and combinations possible within the model rooms by furniture rearrangement	6a 6b
Figure 10 -	Office units built on a double-loaded corridor	6c
Figure 11 -	Classroom-laboratory-office building, Behrend Campus, The Pennsylvania State University	6d
Figure 12 -	How the experimental faculty offices might be used in an office building	6e
Figure 13 -	Locations from which the photographs were taken . . .	8a
Figure 14 -	A corner room arranged for laboratory work	8b
Figure 15 -	Operation of the sliding wall sections	10
Figure 16 -	A two-person work area (Office A)	11a
Figure 17 -	A reception interview area (Office A)	11b
Figure 18 -	An alternative arrangement of the interview area . . .	12a
Figure 19 -	An arrangement for a larger reception area	12b

FOREWORD

Faculty offices that are adequate for serving the needs of teachers, scholars, research workers, and other staff members should be planned and constructed as integral parts of most new educational facilities. The shortage of teachers, the increasing salary budgets, the mounting responsibilities of faculty members, and the need to increase the efficiency of teachers emphasize the desirability of improving their working environments. The provision of adequate offices is a basic and necessary development for improving the morale and efficiency of the faculty.

Entirely adequate faculty offices, auxiliary space, and facilities have rarely been provided in schools, colleges, and other academic institutions. This neglect is both deplorable and costly. There is evidence that such neglect, or lack of emphasis on the design and construction of faculty offices, characterizes much of the current and extensive planning and construction of new educational facilities throughout the nation.

There are conditions which make it imperative for schools, colleges, and universities to confront and solve the problem of providing suitable offices. First, it should be recognized that faculty members and teachers have sound justification for good offices. Their requests are not unreasonable. Such facilities seriously affect their morale and productivity, the kinds of work done (including scholarly efforts), their satisfaction with their positions, and indeed their decisions to remain with an institution or to move to new positions in other institutions. Faculty housing arrangements frequently make working at home less practical than was formerly the case. The growth of institutionalization is increasing the amount of time spent with colleagues, groups, committees, and students. The increasing emphasis on "team teaching" exemplifies this trend. Teachers are being expected to extend the lengths of their working day, week, and year. These and other conditions argue eloquently for the provision of adequate faculty offices in all kinds of educational institutions.

Generally, educational administrations appear either to be unaware of the sound justification for faculty offices or unconvinced of their importance relative to the limitations of resources for buildings and the urgent demands for other types of space and facilities. Regulations for buildings often restrict or prevent the inclusion of adequate office space. Such expedient restrictions frequently lead to the false long-term compliance with traditional practices: **classrooms or laboratories are built and then later converted to faculty offices when it becomes imperative to have more offices.** This leads to great waste and inefficiency. The converted space is rarely suitable because it was planned for other purposes. Ceiling heights, hallways, and exits are of excessive dimensions and therefore reflect wasteful construction for office use. Furthermore, the efficiency of the faculty has been reduced over long periods, and improvisations may neither repair the damage nor improve the conditions satisfactorily. Appropriate investments of building funds in adequate but economical faculty offices are sound investments which need to be proposed, supported, and defended at all levels of administration and during all stages of building and educational planning.

The project **A Faculty Office Study: Design and Evaluation** was conceived during and following discussions of this and other problems with Dr. Harold Gores of the Educational Facilities Laboratories, Inc. The project also reflects the interest of the Administration of The Pennsylvania State University and of the University Development Committee in solving effectively and economically the problem of providing adequate faculty offices for teachers, researchers, and staff of this large and expanding university.

The project was not conceived nor is it proposed as a complete and comprehensive solution for all categories of faculty office requirements. The design studies, the full-scale construction for testing, and the evaluation have been limited to exploring a model for **adequate but economical two-person offices, varied arrangements of the basic model, and the possible uses of these arrangements.** The idea of building a full-scale model of several of the proposed offices and evaluating them prior to incorporating the design in permanent buildings is a technique which would appear to be appropriate for the solution of a number of problems which confront designers of educational facilities.

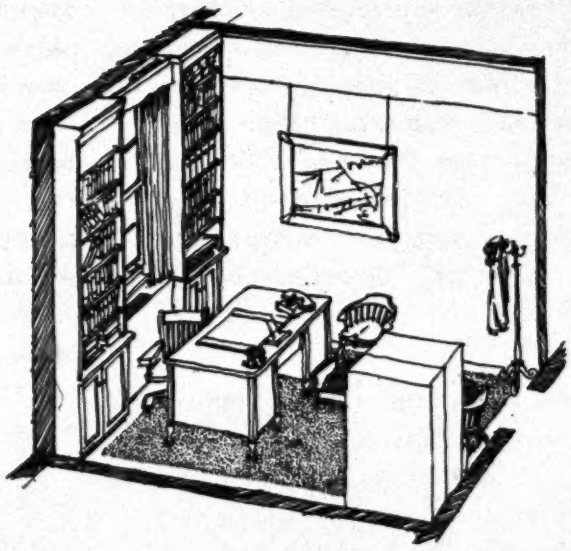


Figure 1 - An ample private office 10' x 12'

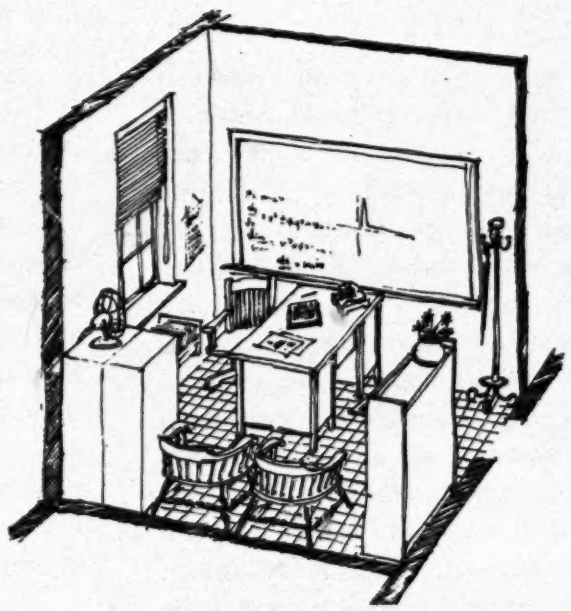


Figure 2 - A 10' x 10' office

I THE PROBLEM

Much attention has been focused on the classroom and laboratory areas of academic buildings, but little consideration has been given to the area in which a faculty member spends much of his working day—his office.

In many cases economic factors do not permit private offices for each faculty member, and the low utilization of some offices makes it difficult to justify even the minimum size of private offices.

The average private office which would be acceptable to most faculty members appears to be approximately 10' x 12'. An area of 10' x 10' is considered minimum. Such office layouts are shown in Figures 1 and 2.

Where private offices are provided, they often exist as a series of rectangular rooms side by side. Flexibility of use is accomplished by placing a communicating door between adjacent rooms. This reduces the usable room area by approximately one-third. Such an arrangement is shown in Figure 3.

In many cases where private offices are unavailable, the multiple-person office or "bull pen" exists. Many of these offices exist in old marginal-use classrooms converted to faculty office space (see Figure 4). These areas are often inadequately lighted and poorly ventilated; and poor acoustics and drab environment contribute little to an efficient and effective faculty office arrangement. Because the offices provide little privacy, interviews with students are discouraged and occur infrequently. Quite often the faculty member prefers to do his necessary office work at his home, which results in further isolation from students and faculty colleagues.

Often faculty offices are sandwiched into the classroom or laboratory plan areas (Figure 5). The only justification appears to be to make the office convenient to a specific laboratory or classroom in which the teacher may conduct classes. All of the criteria which determined the classroom or laboratory design, such as heavy floor structures, high ceilings, depth of room, wide public corridors, and the continuation of laboratory or classroom piping and ventilation systems, are inherent in this type of office design. By its location, the office is adjacent to all of the fumes, noises, and distractions generated in the academic core of the building.

In classes above the elementary school level, the "home room" concept does not usually apply to the average teacher. The faculty member may be assigned to teach in four or five different locations. At the college and university level particularly, many faculty offices need not be related to specific classroom areas.

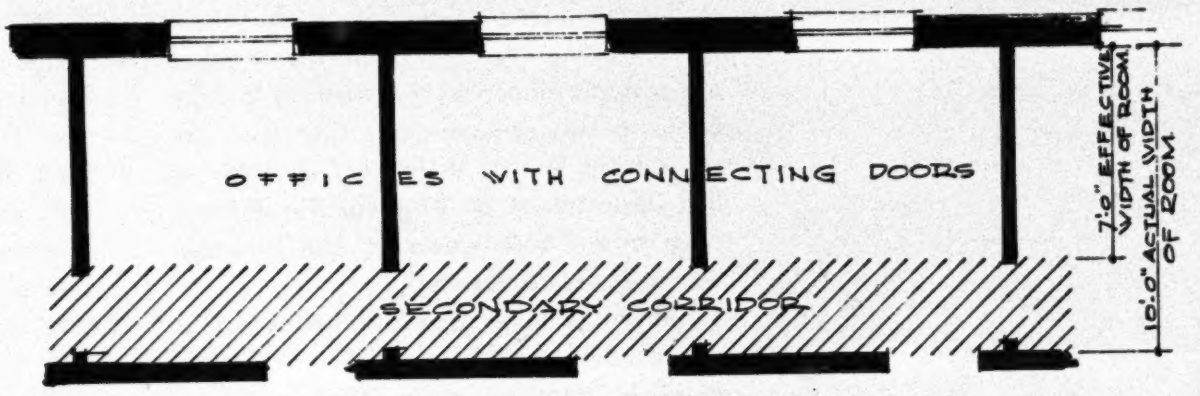


Figure 3 -
A 10' x 10' private office plan with interoffice connecting doors

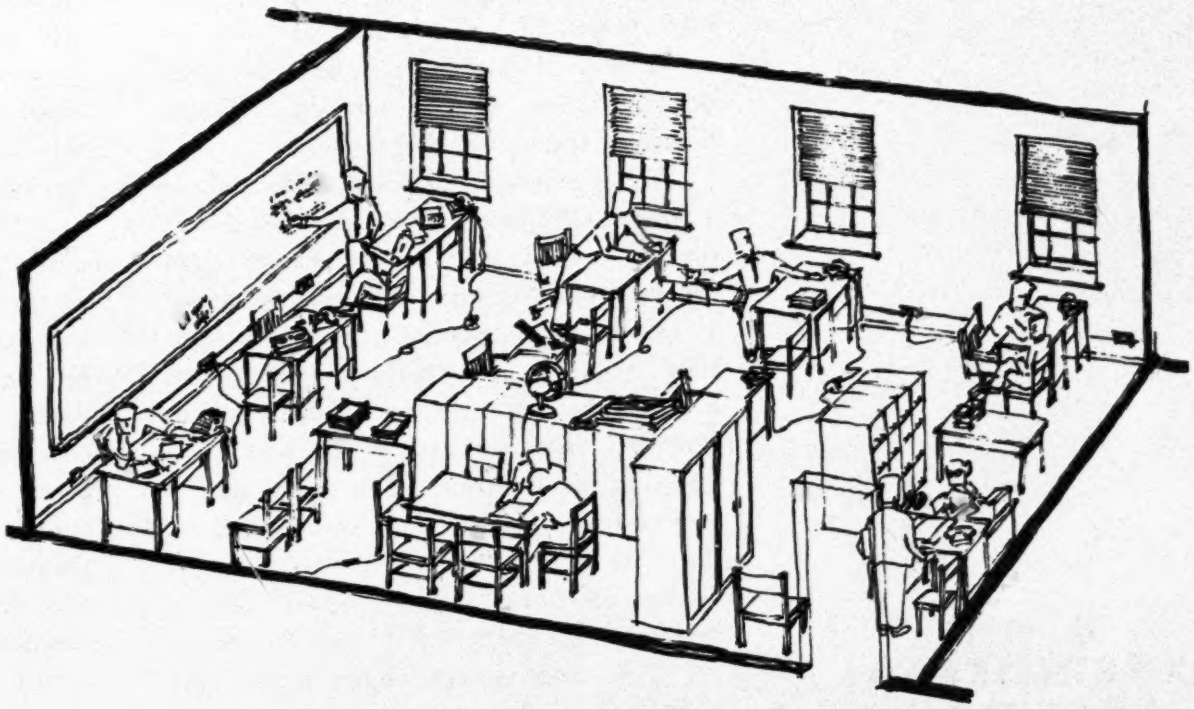
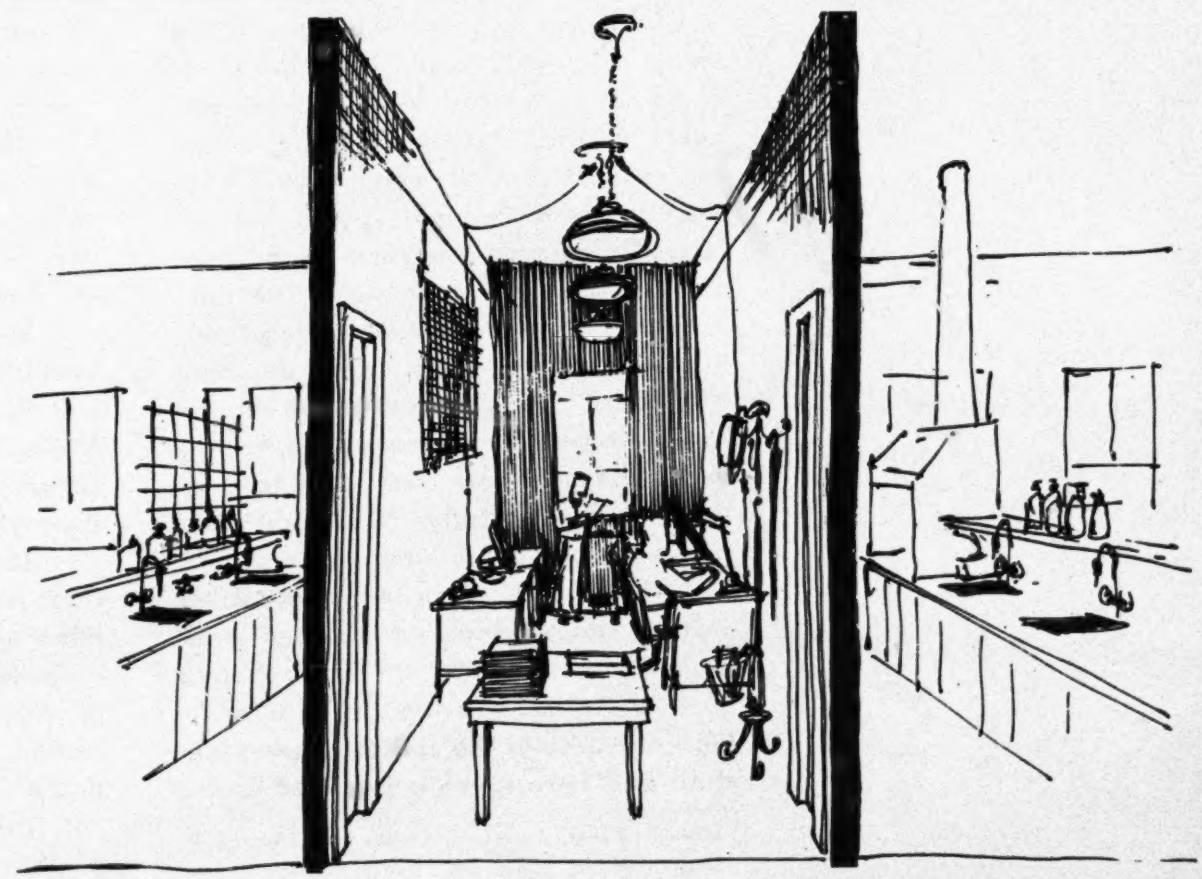


Figure 4 -
A "bull pen" office

Figure 5 -
The typical deep office sandwiched between classrooms or laboratories



II AN EXPERIMENTAL SOLUTION

As a possible solution to the problem of a faculty office that was neither the private office nor the multiple-person office, a two-person office unit was designed by W. H. Wiegand, Director of the Department of Physical Plant Planning and Construction at The Pennsylvania State University.[1]

This office unit is not proposed as the solution to all faculty office problems. If initial cost and maintenance cost are not major problems, a private faculty office for each person is probably the ideal solution. Where low initial and maintenance costs and a reasonably high factor of space utilization are requirements, it is believed that the proposed two-person unit offers a solution to many faculty office problems.

The proposed faculty office unit is a space with inside dimensions 12′ x 16′, giving a total area of 192 square feet for two people, less than one hundred square feet per person. The space consists of two rectangular areas, each 8′ x 12′, adjacent to each other, offset six feet, with six feet of contact area open to each other. One area has a twelve-foot exterior wall with window; the other has a twelve-foot wall on an inside corridor. The finished ceiling height of the room is 8′0″ (see Figure 6).

The unit spaces, each eight feet wide by twelve feet long, might seem to be cramped and give a closed-in feeling. It might also appear that space along the corridor wall would have the effect of being an interior area without adequate natural lighting. In the actual spaces these conditions do not appear to exist because the two spaces are arranged in a shape that makes the total area seem larger than it is. The total area of 192 square feet in a single rectangular shape has a visual diagonal distance of 20 feet. In this office unit the visual distance from corresponding corners is over 25 feet. Day lighting from the window is visible from nearly all points in the interior room.

The 8′ x 12′ space with the outside wall is designed as an efficient work area for two people. Two "L" shaped desk areas are provided with a desk-high two-drawer file cabinet. Adequate chair and knee space is provided at the desk, and sufficient space exists for the inclusion of one or two additional chairs for visitors.

The interior 8′ x 12′ area is entered from the corridor by a door near one end wall. This area is furnished with wall-to-wall carpeting and with inexpensive pieces of contemporary design furniture to provide an area where the decor and function are in contrast to the adjacent work area.

This interview-study area was designed to contribute to a stimulating feeling of change in environment for student interviews, waiting spaces, etc. This facility apparently does not exist in a typical rectangular office space, however spacious, if the overall space has the sameness of decor and the same business office furnishings throughout.

One of the design features of this office unit (or module) is its flexibility, expandability, and convertibility. The units could also be prefabricated. They can be combined in any number of repetitions of the basic two-area unit and can be built on one or both sides of a corridor. The units turn inside or outside corners so that many basic building shapes are possible. Between each unit of offices, a section of two of the wall areas are sliding walls, floor to ceiling, which can be moved by the occupants to provide access to the adjacent office spaces. When the sliding walls are moved, they can be arranged to provide or restrict communication between different combinations of spaces.

The conversion of the spaces can be made by the occupants without major construction to remove walls or doors and without lighting, heating, and air conditioning changes.

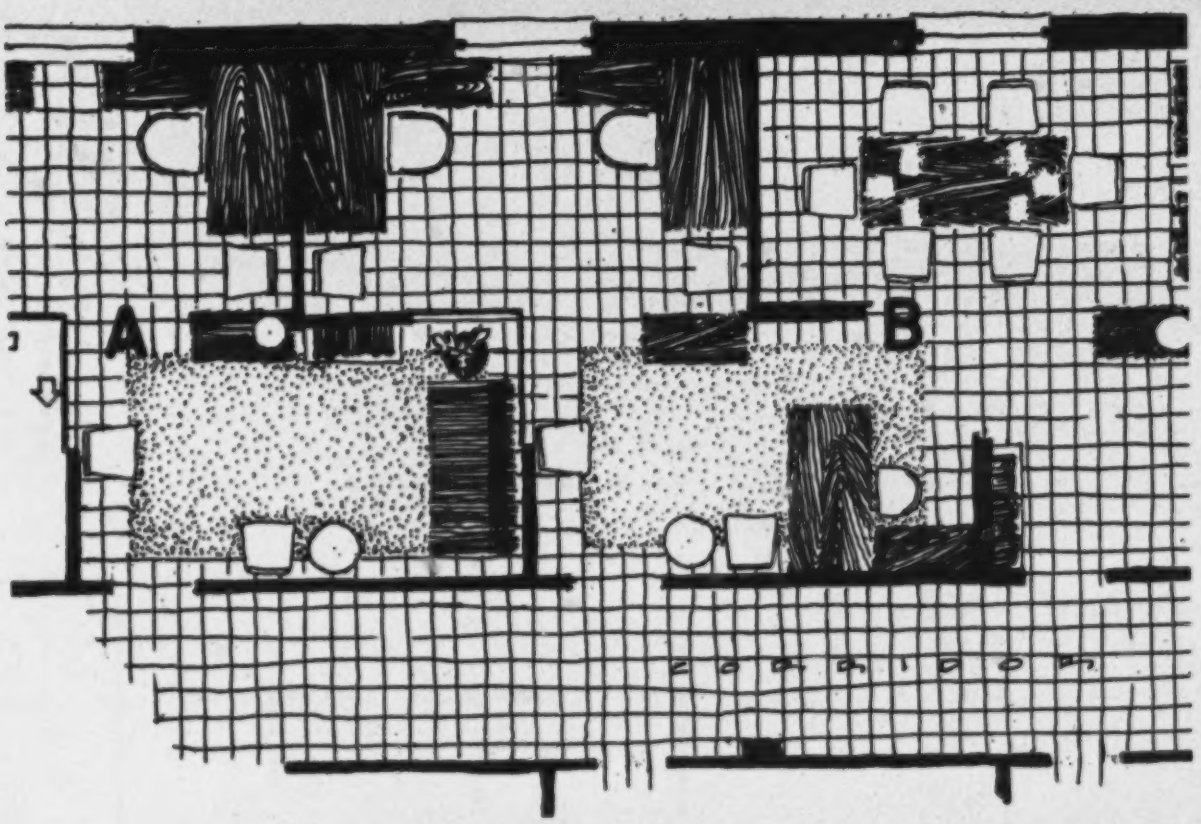
Several of the many combinations possible are suggested in later sketches.

Figure 7 shows the floor plan of the full-scale model of several of these units which were built and evaluated at The Pennsylvania State University.

The two-module office entered at Door A illustrates the typical two-person office unit. The two sliding wall sections indicated by a thin black line are closed to the adjacent spaces. When these sections are closed, conversation is not audible through the walls.

Through Door A one enters the 8′ x 12′ space closest to the corridor. This area with wall-to-wall carpeting or

[1] John D. Miller, James M. Cartey, and Angelo R. Bigatel of the same department assisted in the planning and development of the model rooms.



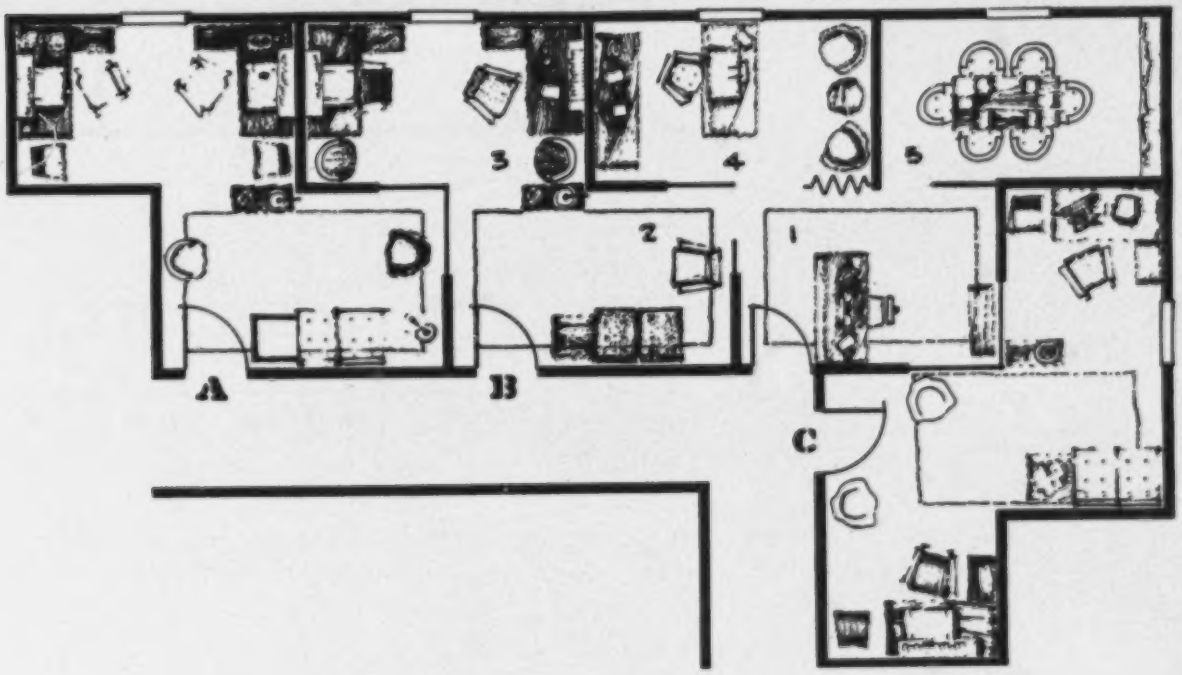


Figure 6 -
Layout of the experimental two-man office

Figure 7 -
The floor plan of the full-scale model built and evaluated at The Pennsylvania State University

Figure 8 and Figure 9 -
Other variations and combinations possible within the model rooms by furniture rearrangement

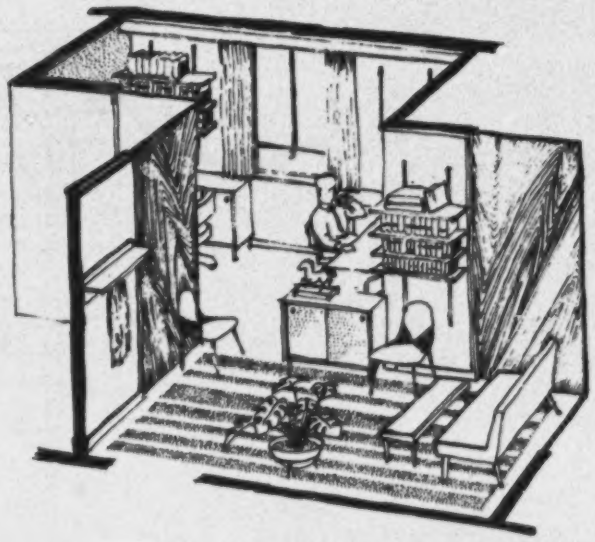
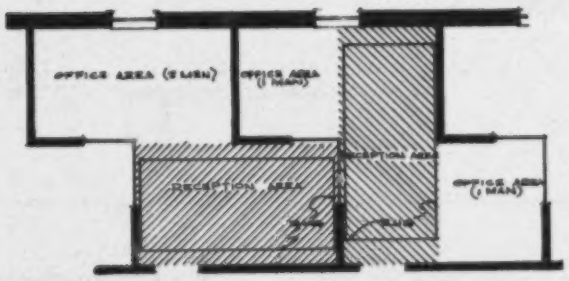
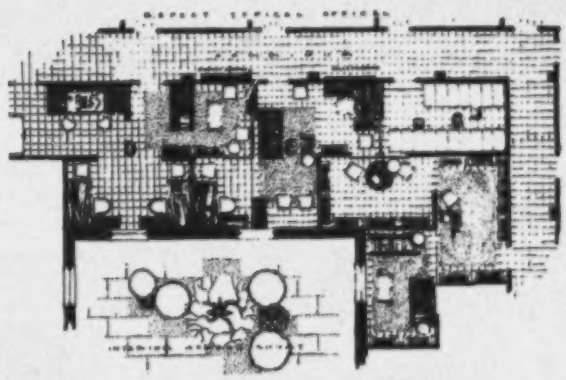


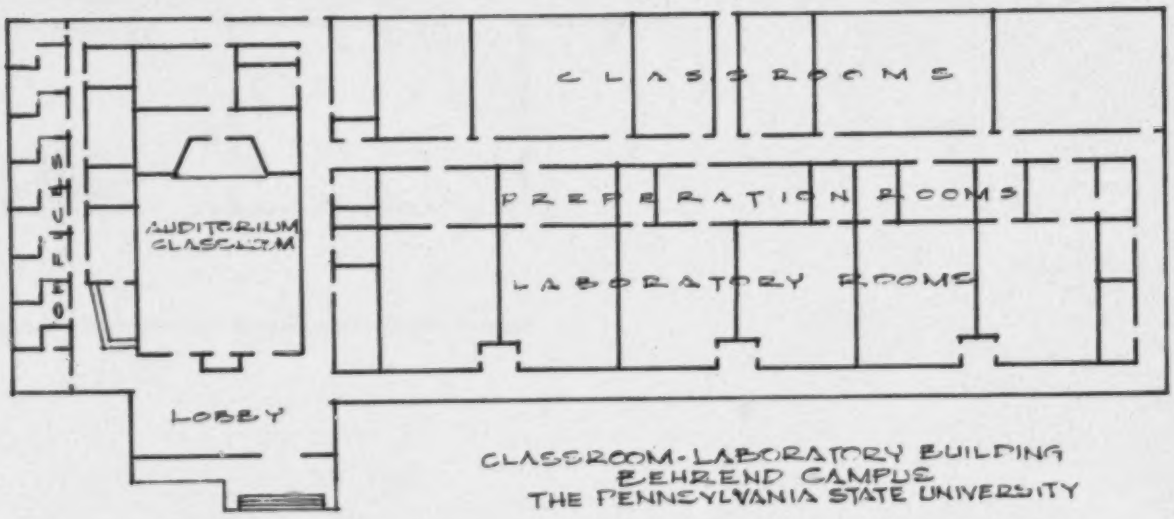
Figure 10 -
Office units built on a double-loaded corridor

Figure 11 -
Classroom - laboratory - office building, Behrend Campus, The Pennsylvania State University

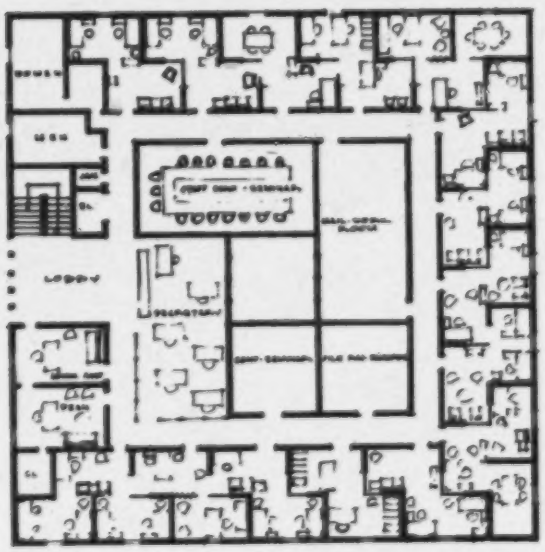
Figure 12 -
How the experimental faculty offices might be used in an office building

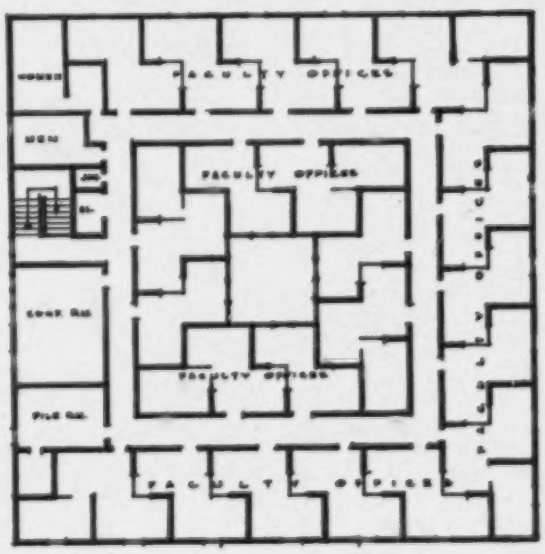






CLASSROOM-LABORATORY BUILDING
BEHREND CAMPUS
THE PENNSYLVANIA STATE UNIVERSITY





a smaller rug is the reception-study-conference area, with an upholstered davenport, chairs, lamps, and lamp tables. The 8′ x 12′ space with the exterior window is the office desk area with efficient working space for two people and with space for other chairs and desk-high file cabinets. This two-area space has 128 square feet more wall area than the same area enclosed in a rectangle. Liberal use is made of color. In the model the walls were painted beige and the desks brown. Bright color accents in red, yellow, or blue were provided by the chairs and davenports (see Figure 8).

At Door B one enters a suite combination of five 8′ x 12′ areas which are composed of two typical two-person units plus an 8′ x 12′ area provided to turn the exterior corner. This suite is suggested as a combination that provides for a faculty team that requires a secretary in the 8′ x 12′ area numbered 1, which has a door to the corridor and is adequate to serve as a reception area and secretarial work area. At the desk in area 1 the secretary has visual control of the four other spaces numbered 2, 3, 4, and 5. Space 2 with a separate door to the corridor serves as a waiting-study-conference area for the suite and is used by the two faculty members having their desks in area 3, as well as the faculty person who has space 4 as a separate office. The sliding wall sections between rooms 1, 2, and 4 may be opened or closed by the occupants at will to isolate the areas and provide semi-privacy. Space 5, with ample wall area for shelving, functions as a laboratory or conference-seminar area and can be isolated from space 1 by the sliding wall section which closes the entire entrance from space 1.

The two other spaces entered through Door C illustrate the basic two-space unit, with sliding wall sections closed to adjacent areas. In this unit the same furniture used in the unit entered through Door A has been rearranged to provide a central carpeted reception-conference area from the door to the exterior wall but with the faculty desk areas in the alcoves to the right and left of the central area.

Figures 8 and 9 illustrate variations and combinations possible within the model rooms by furniture rearrangement.

The 8′ x 12′ basic space areas can be combined in any number of combinations from two spaces to a suite of spaces—in this case consisting of all of the nine areas built. In all of the combinations traffic circulation and visual communication between spaces is possible in a manner that cannot be achieved with uniform rectangular spaces having a unit depth from corridor to outside wall and with communicating doors between them.

Figure 10 illustrates how the office units can be built on a double-loaded corridor. Units D, E, F, and G are built around an inside corner with windows facing an interior garden court. Similar offices on the other side of the corridor have their window walls on the external building facades. Unit D suggests a three-space area in which two faculty members have desk areas in one module, use a second module as a drafting room or work room, and have a third as a student conference-reception-lounge. Unit E is a variation of the two-person unit. Unit F suggests how three areas might serve as a departmental office library. Unit G is one module used as a general file room. It could also be included as a fourth space to enlarge Unit F. Other combinations of spaces are possible and may suggest themselves to faculty members faced with the need for a solution to their own office space problems.

The corridors, if provided at intervals with wall surfaces of tack board material and with the mounting channels for bracketed shelving, could provide for exhibits of faculty art work or displays of interest to other faculty members or students. In this way with proper display lighting the corridors could be an attractive and interesting part of the faculty office area rather than a drab and depressing traffic tunnel.

These offices can be built in a simple rectangular building area where only a limited number of offices are required, such as may be the case in many of the smaller public school or college buildings. At the Behrend Campus of The Pennsylvania State University at Erie, Pennsylvania, the new one-story classroom and laboratory building being constructed for occupancy in 1962 incorporates a number of these offices in an office area. The floor plan of the building is shown in Figure 11.

Figure 12 indicates how a large number of these offices could be incorporated into a multi-storied office building with other facilities.

The ground floor might contain any necessary private administrative offices of a conventional type along with a central lobby, reception area, and central secretarial pool area. Conference rooms of required size, seminar and work rooms, mail rooms, storage, stairs, and toilet facilities can be designed to fit into a plan that uses these modular offices.

Since a faculty member's office work occupies only a part of his workday, he is often without secretarial assistance because full-time assistance cannot be justified and part-time workers are not readily available. The usual solution is to provide a small full-time secretarial group to assist a large number of faculty people. When the number of faculty members with offices in a single building is large enough, as suggested in Figure 12, it is often economically feasible to provide central automatic dictation equipment and telephone devices which make each faculty office telephone a dictation machine connected to a number of dictation recorders located in the area of the secretarial pool. A few girls with this type of equipment can serve as secretary-typists to a large number of faculty members, in addition to acting as their telephone answering service and receptionist if the installation is properly planned.

The basic unit contains a high degree of built-in flexibility. The purpose is to anticipate the requirements of the wide variety of individuals who will occupy this type of office and make provision for these requirements without the necessity of incurring expensive and inconvenient construction work. Although the unit was planned as a two-man unit, there is no reason, of course, why a given unit could not be used by one person, where such an arrangement can be justified.

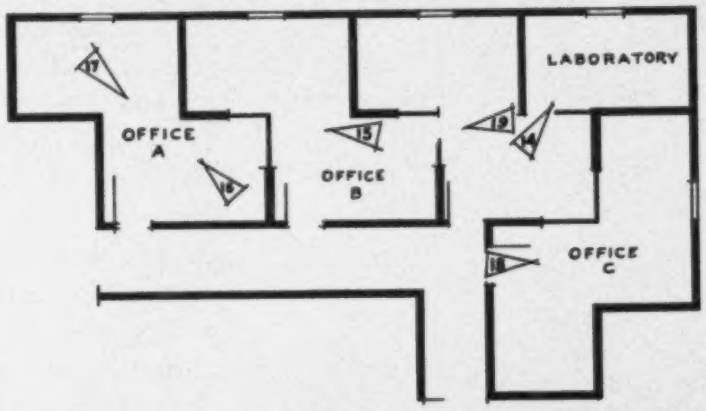
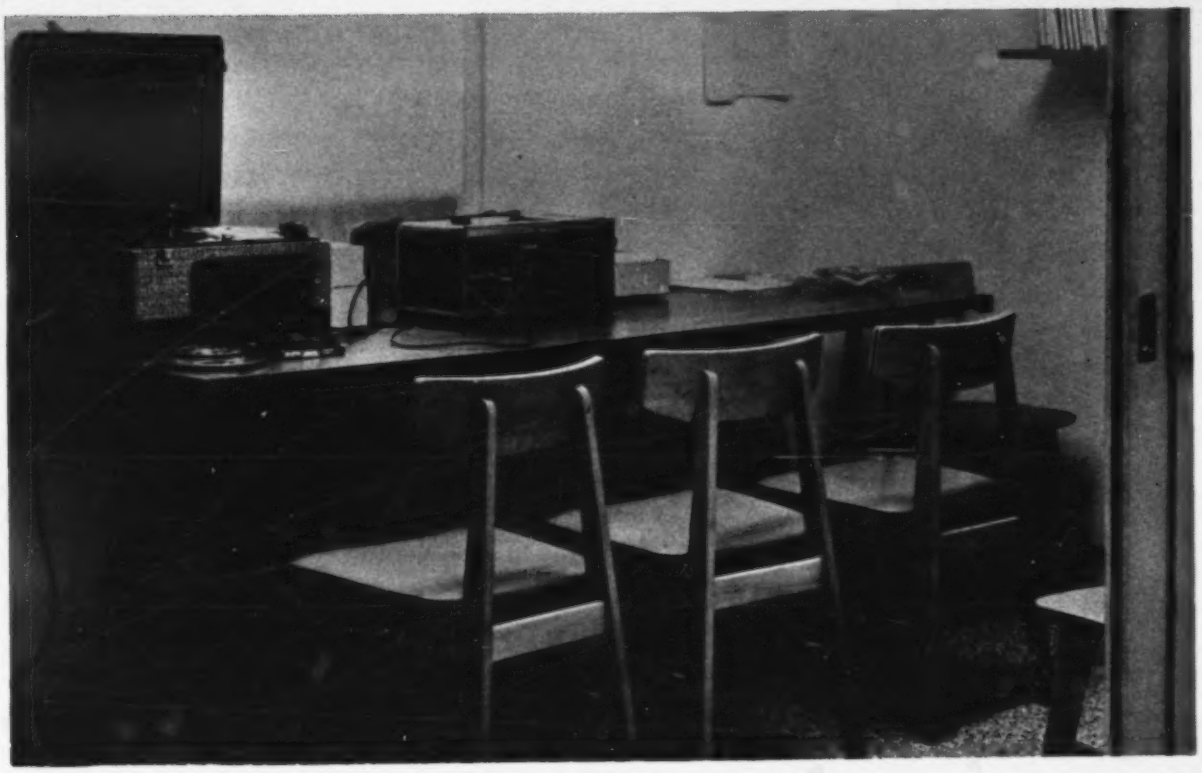


Figure 13 -
Locations from which the photographs were taken

Figure 14 -
A corner room arranged for laboratory work



III
CONSTRUCTION DESIGN

The end walls of each space and the portion of the side wall formed by the overlap of the spaces (exclusive of the movable walls) are equipped with adjustable shelf strips spaced approximately two feet on center. This provides thirty-two lineal feet of wall space thus equipped. In addition, the two end walls of the work area have, as the finish wall material, a perforated hardboard providing for a large number of possible uses by the individual occupant.

In a building which would incorporate this type of faculty office, storage rooms would be provided at central locations, and these would contain shelf brackets and shelving in a variety of widths and lengths. These storage rooms would also carry a stock of prefabricated items such as letter trays, magazine racks, and simple sliding door storage cabinets, all of which would mount on either the adjustable shelf strips or the perforated wall by the simple insertion of the proper hanging device. This would allow the occupants of the offices to achieve an almost endless number of variations to suit the need and use of each office at any particular time. The installation of these brackets and hanging devices is simple and can be done by the occupant without the delay or expense of obtaining skilled labor.

The end walls of the work area and the portion of the wall containing the sliding sections (the entire z-shaped wall dividing the basic units) are ideally suited for prefabrication. Only two units are required for the entire office area, a solid area wall section and a sliding wall-pocket section. The two sliding wall sections shown on the plan are of the same size and construction, the only difference being the locking hardware which would be installed after the units are in place.

Coat space is provided by a simple prefabricated shelf and hook strip which is installed on the wall adjacent to the entry door from the corridor and so placed that it is concealed behind the door when open. This provides an out of the way location, yet convenient to the entry, and does away with an awkward piece of movable furniture.

Lighting is provided by recessed ceiling fluorescent fixtures in each section of the basic unit. These lights would be controlled by switches at the room entrance. Receptacles are provided on the exterior building wall and on the corridor wall. Receptacles would not be placed on the prefabricated end walls of the spaces in order that the construction of these units be kept as simple as possible. Double-celled under-floor duct would be run through each space of the basic unit approximately in the center of the space. This double-cell duct provides for electric and telephone service and can be tapped where an electric or telephone outlet is required.

Heating and/or cooling can be accommodated in several ways, depending on the building location and structural system. The simplest method of heating would be to install either a free standing or recessed convector under the window on the outside wall.

The experience with the full-size mock-up indicates that a seven-foot ceiling height is adequate in the corridor. This allows at least one foot over corridor ceilings in which air conditioning ducts could be located with discharge through the office wall over the entrance door. This space over the corridor would also accommodate a double duct system with both heated and cooled air being blended at the outlet and circulated into the room as required by the thermostat. The double duct type system could also be used to advantage with a cellular steel floor similar to the Robertson Q-Floor. This system would introduce the tempered air at the outside wall under the window. Any of these systems which require the movement of air would use the corridor as a return air plenum.

Plumbing would be provided only at toilets and in some work rooms, but these would be stacked from story to story in the interest of economy.

This office concept will work well with several types of building construction. The basic construction could be a reinforced concrete frame with a structural concrete floor, a steel frame with concrete floor, or a steel frame with a cellular steel structural floor.

The building module is such that columns may be placed on twelve-foot or twenty-four foot spacings on the length of the building depending on the subsurface conditions. These conditions would also determine whether columns would be placed on either or both sides of the corridor.

It is proposed that the exterior wall be constructed of masonry brick facing with a concrete block back-up forming the interior finish wall. If a convector is used as the means of heating, an insulated metal panel under the window will provide space to recess the convector and obtain a flush inside wall. Curtain wall construction would also be satisfactory with this office plan.

The corridor walls would be concrete block with a painted finish. All interior space divisions on either side of the corridor would be obtained by use of the prefabricated wall units mentioned previously.

We have attempted in this office solution to provide not only an efficient, compact, and comfortable office but also one which can be constructed at a reasonable cost.

The greatest saving in cost will be effected by the repetition of units. This saving will be directly related to the number of units constructed. This repetition will be reflected in the building structure where each bay will be the same and in the prefabricated wall units, exterior windows, heating units, etc.

Additional cost savings will result from using simple and inexpensive finish materials; for example, painted concrete block for the fixed walls.

The use of low ceiling heights will also have a favorable effect on the cost. A four-story office building using this plan and retaining the eight-foot ceiling height can be constructed in the volume normally required for a three-story academic building.

In a faculty office building constructed in this manner, cost studies will indicate that, due to the greater concentration of construction materials per unit of volume, square foot or cubic foot costs of the structure will be higher than one containing average size private offices. However, the unit cost per faculty member accommodated and the total cost of the building will be less for the following reasons:

1. There is less total office volume and area per faculty member accommodated.
2. There is less corridor circulation area required per unit.
3. The reduction of total building area and volume will result in correspondingly less costly plumbing, heating, air conditioning, and electrical system installation costs.

The building, for the same reason of reduced area and volume, will have lower annual operating and maintenance costs. It naturally follows that any building smaller in area and volume will cost less to build, operate, and maintain than a similar but larger building. In the case of an office building of the type suggested, it is believed that these savings are made not by the basic reduction of the office area and volume per se but more properly by the increased utilization of the area provided, which makes possible the reduction of total size.

The photographs (Figures 14 through 19) illustrate the interiors of the full-scale model offices as they were built, furnished, and used. Figure 13 indicates by numbers in triangles the position of the camera when the photograph indentified by the same number was taken.

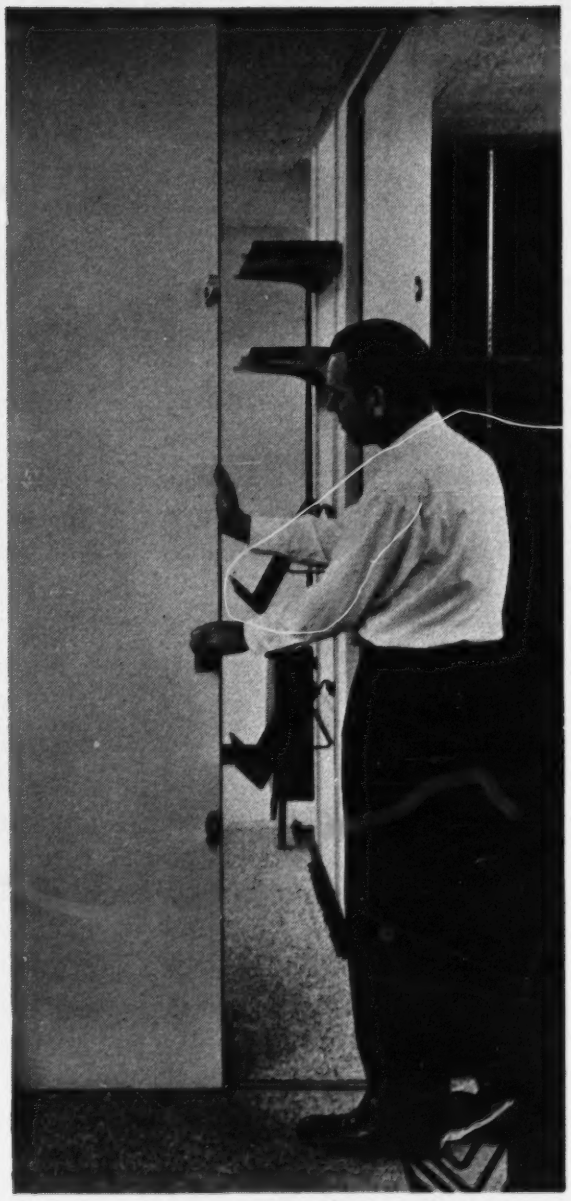


Figure 15 - Operation of the sliding wall sections

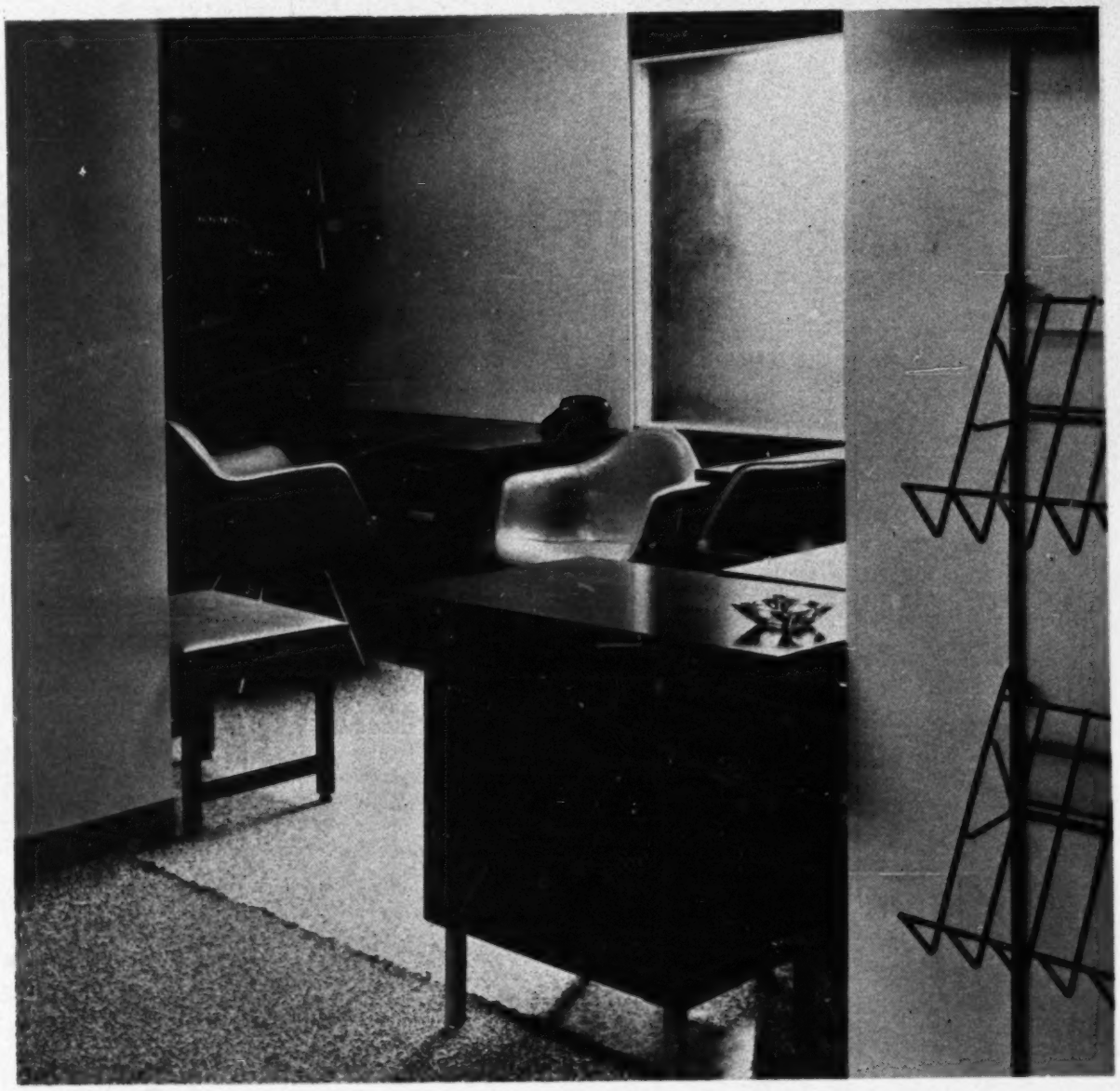
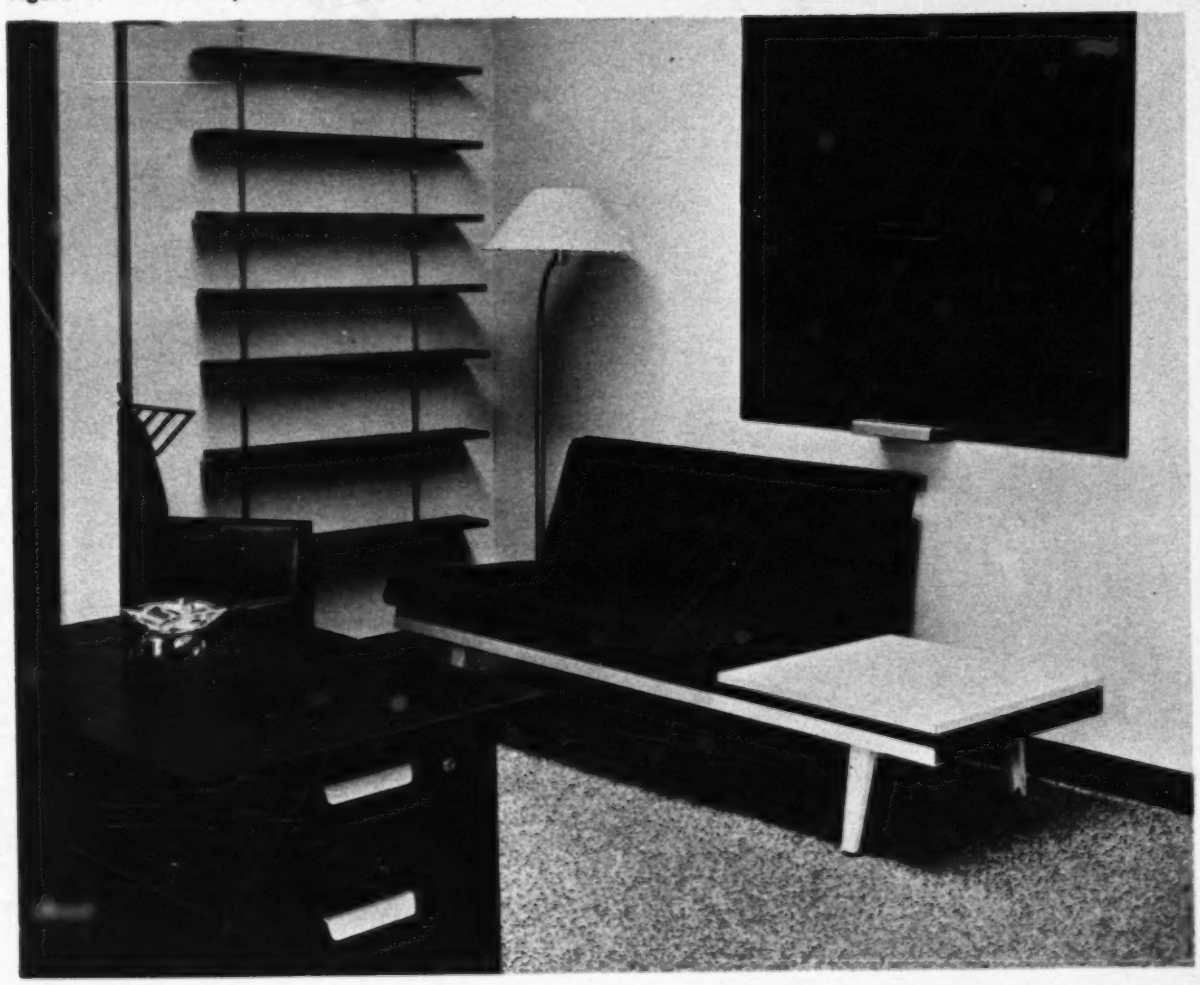


Figure 16 - A two-person work area (Office A)

Figure 17 - A reception interview area (Office A)



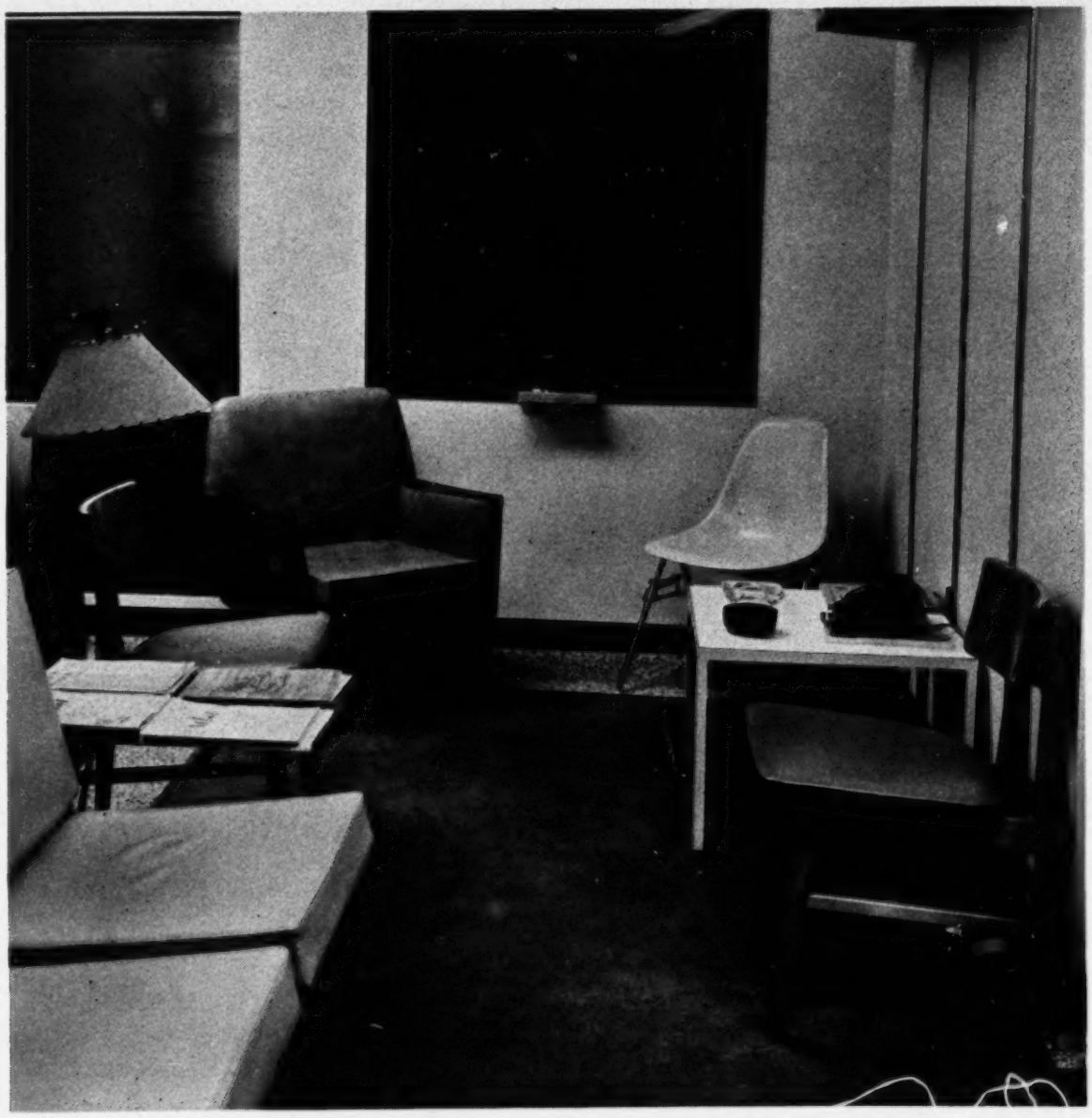
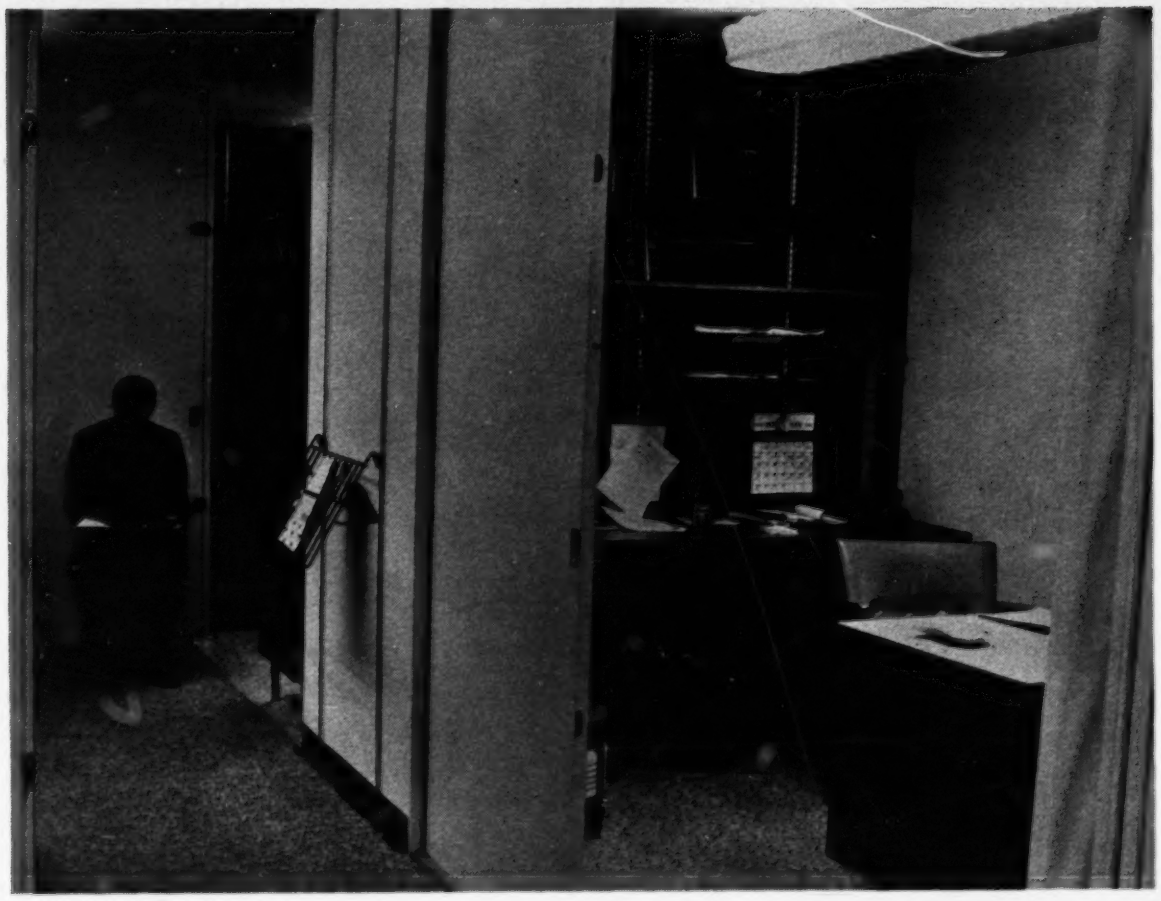


Figure 18 - An alternative arrangement of the interview area

Figure 19 - An arrangement for a larger reception area



IV EVALUATION

Objectives

The general purpose of the research phase of this study was to evaluate the experimental structures as two-man faculty offices in terms of their acceptability to faculty members and their operational effectiveness.

The original plan was to make modifications to the mock-up on the basis of initial studies and to continue the evaluation. However, shortage of funds made it impossible to carry out such structural modifications.

Procedures

Two different procedures were followed in carrying out the evaluations:

(1) Faculty members were invited to inspect the model offices and to indicate their reactions on an evaluation sheet (see Appendix 1).

(2) Faculty members from two different departments were invited to occupy the offices for a semester. These individuals were interviewed from time to time and their reactions were noted (see Appendix 2).

Results

A. Reactions of Visiting Faculty Members

The experimental faculty offices were constructed within what was formerly a large dining hall centrally located on The Pennsylvania State University campus. Construction was undertaken during the summer and early fall of 1960.

As soon as the offices were completed a number of faculty members were invited to visit them. The members of this initial group were asked to state their reactions on an open-ended questionnaire. The evaluation sheet was developed on the basis of this initial study.

Subsequently several open houses were scheduled. Faculty members attending the Faculty Luncheon Club were invited first. Later personal invitations were extended to members of the administration, deans, department heads, and to individual faculty members representing such areas as mathematics, speech, psychology, home economics, romance languages, physics, education, economics, engineering, journalism, zoology, continuing education, and library science. In other words, efforts were made to secure a cross section of faculty members.

Following these invitational open houses a general invitation to inspect the facility was published in the "Faculty Bulletin." A general invitation was also forwarded to each department on the campus.

The procedure adopted at each open house was to welcome the visitors with a brief orientation speech about the project and its purpose (given by W. H. Wiegand, either in person or recorded on tape). The visitors then viewed a model of the facility and a display of sketches indicating possible layouts. They were then invited to walk through the model offices at their leisure and to ask questions of the staff. Immediately after the inspection each visitor was invited to fill out the evaluation sheet.

In spite of widespread personal invitations only about 60 faculty members actually visited the facility, and many of these did not fill out the questionnaires. In total, 36 questionnaires were satisfactorily completed.

It is difficult to say what the reason was for this unexpectedly small number of visitors. It may have been due to a lack of interest or, perhaps more likely, to the fact that most people are extremely busy and difficult to divert from their set habit patterns and other commitments.

Of those completing the evaluation form, 50% held the rank of associate professor or above, and 50% were assistant professors or below. Most of the professors and associate professors had offices in their homes as well as at the University. In most cases those in the lower faculty ranks did not have offices in their homes and spent much more working time in their university offices than did those in the higher ranks.

The average time spent by the respondents in their university offices was 28 hours per week, with a range from 5 to 65 hours.

These faculty members use their offices for the following purposes:

Purpose for which office is used	Proportion of Total Uses Mentioned
Counseling students	19%
Conference with colleagues	16%

General writing	13%
Preparation of instruction	13%
Research	13%
General reading	12%
Committee meetings	9%
Administrative	5%
	100%

For this group the average number of occupants assigned to a university office was 3.16 (range 1-20). The average office space available for each person was 93 square feet.

Many of the faculty members who inspected the new faculty office mock-up work in 8' x 4' office cubicles built into former classrooms. These cubicles are not soundproof. Attitudes toward this kind of "temporary" office were generally negative and may have influenced the reactions of these people towards the mock-up offices which they were asked to evaluate.

The responses to individual variables in the offices were as follows:

1. Lighting - generally approved.
2. Shelving - approved by lower-ranking faculty members, but considered insufficient in size by some department heads and professors.
3. Privacy - considered adequate by faculty members who already share office space; considered inadequate by department heads and professors who have private offices.
4. Furnishings - well liked.
5. Color schemes - approved.
6. Provision of a conference or waiting room area in each office - very well liked.
7. Space - considered excellent space utilization but too small.
8. Preference for office layout A or C (see Figure 7) - 83% of the observers preferred the layout of Office C with desks and work areas at opposite ends of the offset rectangles separated by the conference or waiting area.

General observations: Generally the observers considered the offices to be too small even though many of them have less space in large offices which they share with others.

The design as a whole was considered to offer greater privacy, with the two-man occupancy objective in mind, than the situation to which most of the observers are now accustomed.

Many of the observers described the ideal solution to the office problem as a large private office for each person with an adjacent waiting room and personal secretary. They did not seriously believe that such provisions could be financed or that the need would completely justify the expenditure.

Several people were interested in possible designs of cell-like private offices, about 10' x 10' in area, equipped with files and with a nearby secretarial pool.

Many of the observers agreed that, for discussion and social reasons, they would probably prefer the flexible two-area, two-man office arrangement to a one-man private office. Faculty members who work closely in educational or research programs felt that the design under study would facilitate this kind of work.

Some professors found the offices ideally suited for one teaching professor with a graduate assistant (or secretary), and others visualized the possibilities of scheduled uses of a unit in such a manner as to provide occupancy by one faculty member at a time.

A major problem was again indicated—that of matching faculty rank and needs with office sizes, furnishings, and number of occupants. An operational plan is needed which would be more equitable and functional than existing procedures. Note: It is suggested that a basis could be established by an analysis of uses, kinds, and amounts, which would permit office assignments in terms of principles of utility rather than rank. This procedure would violate, however, the system which provides offices as status symbols and rewards for achievement.

In the present study it was found that there is a negative correlation of −.72 between faculty rank and amount

of time spent in the university office. That is, associate and full professors tend to spend less time in their university offices than assistant professors and instructors.

The possibility exists that the experimental office design under study has greater possibilities for flexibility and variability in use than the offices generally occupied by faculty members. The sliding doors and number of relatively secluded work areas tend to personalize the offices. In this design it is also possible for the faculty member to individualize his work area by variety in color, furnishings, and pictures and by varied arrangements of furniture within the space. Such variations between desk areas and conference areas and easily achieved variations in decor can reduce the feeling of being "institutionalized."

In summary it can be said that most of the observers would prefer private offices even if small, but if two-man offices are the minimum that would be economically feasible, then the new design is very acceptable and has many desirable features in furnishings and flexibility of use.

B. Evaluation by Occupants

It was believed that the most useful and dependable evaluation of the new office design would result from its occupancy by a group of faculty members for a fairly long period of time. Accordingly, the Departments of Speech and Slavic Languages, which were pressed for office space, accepted the opportunity to have faculty members work in the experimental offices for a semester (16 weeks).

Eight faculty members moved into the offices in January 1961. The group included an associate professor, two assistant professors, four instructors, and one graduate assistant. All of these individuals had previously occupied multiple-person offices in converted classrooms.

General reactions: The occupants generally agreed that in comparison with their previous offices the experimental offices offered:

1. Greater mobility and flexibility.
2. Greater privacy.
3. Better facilities for student-professor conferences.
4. Greater opportunity for small group conferences.
5. More attractive working environment.
6. Adequate book shelves and file space.
7. Excellent waiting-conference space.

The principal complaint related to the inadequacy of the ventilation system. Ideally, these offices would be air-conditioned. Funds did not permit installation of air conditioning in the mock-up. Instead a suction fan operating through ducts was used. This proved to be inadequate.

In general most of the occupants would have liked more space and better soundproofing. All agreed, however, that the new design was a great improvement over their existing multiple-occupancy offices.

Individual reactions to the offices by their occupants are given in Appendix 2.

It should be noted that the adverse comments concerning ventilation, windows, and sound travel were due entirely to the temporary type of construction used in building the mock-up. This would not be the case in actual construction.

The model rooms were built inside a large room which itself did not have adequate ventilation. The rooms had simulated windows of frosted glass instead of actual operable windows in an exterior wall. The walls generally were plasterboard mounted on one side of wood studs instead of being masonry. Some of the walls had plasterboard on both sides of the studs.

Ceilings were ½" cane-fibre tile mounted on the bottom of wood ceiling joists with nothing above to prevent sound travel from one space to another.

Because of faculty requests, the model rooms will continue to be used as offices until the building they are in is remodeled at some future date.

APPENDIX I

A NEW CONCEPT IN FACULTY OFFICES EVALUATION SHEET

The Educational Facilities Laboratories has made it possible to construct full-scale models of these faculty offices. The principal reason for building them was to provide faculty members with the opportunity to see, use, and evaluate them in terms of their acceptability, appropriateness, and utility. Information from you is needed before these new kinds of offices are recommended to colleges and universities and actually built into permanent structures. Therefore, please give us true reactions, objective judgments, and clear suggestions.

Information for data classification:

Department .....Academic Rank .....

Position Title .....

Information on your present office:

Approximate Size .....Building .....

Floor .....Number of Occupants .....

Estimated time per week during which you work in your office .....

Do you have an office at home? .....

How your office is used - check appropriate functions:

Research ..... Preparation of Instruction .....

Committee Meetings ..... Counseling Students .....

Conferences with Faculty Colleagues .....

General Reading ..... Writing .....

Others: .....

.....

State three of your most favorable reactions to the office models.

1.

2.

3.

State three of your most unfavorable reactions:

1.

2.

3.

Assuming that you would occupy a place in offices like these, what changes would you recommend to make them more suitable for you and your kinds of work.

If you were one of two people in a two-person office, which arrangement would you prefer?

1. Two desks in one area with sitting room near corridor as in Room A .....

2. Desk areas separated in different areas with sitting room between as in Room C .....

APPENDIX II

REACTIONS OF FACULTY MEMBERS

A. Comments by Faculty Members in Occupancy

Associate Professor A

Original Office: High ceiling room shared with three others.
Location: Office C in experimental model

Remarks:

Positive

Space design is good; has many flexible possibilities. Superior to ordinary two-man office, greater comfort. Carpets were a good idea. Sliding doors make the design quite mobile.

Negative

Can't separate the fixtures from the space; evaluation of the design is colored by the type of furniture. Offices offer more comfort than utility. Lack of privacy. Glass door would have been better. Ventilation very poor. Offices should be slightly larger in order to expand "sitting area" so that groups of students can sit without hitting each other's feet. Cheap construction. Outside wall should be completely glass.

Assistant Professor B

Original Office: Converted classroom with partitions shared with 10 others.
Location: Office C in experimental model

Remarks:

Positive

I like two-man office rather than the converted classroom idea. The lounge area idea is very good. There seems to be ample space even for a full professor. The bookshelves are good—expandable. Ideal for graduate assistants and visiting students. More students have come in than in old crowded offices and they feel more like chatting. They think it's wonderful. Frequency of student-teacher communication has increased. The design is good. Much better than my former cubicle. Noise level is reduced. Very easy to work in—easy for students.

Negative

Insufficient storage space and poor ventilation. More light would be desirable.

Assistant Professor C

Instructor D

Original Office: Converted classroom with partitions shared with eight other people.
Location: Office A in experimental model.

Remarks:

Positive

We liked it. Surroundings are conducive to pleasant conversation. You can see more than one student at a time. The waiting room idea is very good. Furniture, pastel colors, and carpeting were especially nice. Students seemed to like the offices very much. Many students mentioned how nice the offices were. The two-man office has sufficient space for two men with interlacing office hours. The ceiling height was o.k. We liked the privacy.

Negative

The rooms were not soundproof. You could hear everything in the next room. One sometimes got a feeling of claustrophobia. Ventilation was very poor. Often the rooms were over 80° and stuffy. The material seemed very cheap. Accordion door (Room 4) functioned very poorly. Hall ceiling too low—hall too small.

Instructor E

Original Office: Converted classroom with partitions shared with 10 others.
Location: Office B in experimental model.

Remarks:

Positive

A lot better than we had before—completely better. Much more freedom for students; relaxing, attractive surroundings. Homier. Design is convenient. Nonoverlapping office hours make the two-man office very usable. There was greater privacy working with students. Language lab in conference room excellent. More students came voluntarily—just dropped in. Students favorably impressed—first comfortable place to come and sit down. Can also find privacy for discussing problems—bull sessions, etc. Can handle two students at a time. Noise level much lower; can do voice work without self-conscious feelings.

Storage space adequate. Bookshelves fine. Color arrangements good and necessary.

Negative

Not airy. Ventilation very bad. Would like more privacy. Could always hear someone else. Wouldn't like "cell" set-up though. Two people enough. Can't move the sliding partitions easily enough. Students get claustrophobia in conference room. Students afraid that you can't get the sliding partitions open again. Afraid to be locked in. Real windows would help. Want some natural light. Would like some practice rooms (half-size) for language laboratory.

Instructor F

Original Office: converted classroom with partitions shared with 10 others.
Location: Office B in experimental model.

Remarks:

Positive

Liked most the space for books and papers. Language lab possible and excellent; fitted in nicely. Good for conferences; can get privacy. Very cheerful to work in. Colorful. Furniture very comfortable. Desk and cupboard space good. Design good; efficient. Space good.

Negative

Very minor things. Placement of blackboard so I can write while I talk. Windows should be real. Rest rooms non-existent in area. Ventilation improved with floor fans. Some lounge areas superfluous. Can't have private conferences while students are waiting. Accordion partition (Room 4) is useless. Soundproofing not too good.

B. Comments by Visiting Faculty Members

The design itself appealed to most visitors. Some of the favorable comments were as follows:

- . . . informal attractive waiting rooms conducive to improved faculty and student morale
- . . . pleasant areas for informal conferences
- . . . waiting room for students excellent
- . . . the layout will tend to build greater cooperation among the staff
- . . . more space than at present, with fewer occupants
- . . . sliding panels might be a good idea
- . . . proximity of books good
- . . . over-all idea is a step in the right direction
- . . . good utilization of space
- . . . charming, interesting atmosphere
- . . . good traffic control
- . . . adaptable in special arrangements to meet needs of a variety of people's tastes.
- . . . amount of space is good

Room C arrangement was preferred by 84% of the visitors (see Figure 7).

Unfavorable reactions, other than to furniture and construction materials, were as follows:

- . . . secretary too far away
- . . . waste of space in waiting room
- . . . conference room too small for conferences
- . . . increase space by one-third
- . . . prefer single-man office
- . . . ceilings too low
- . . . not enough window area
- . . . lack of privacy
- . . . students waiting in office
- . . . space for files too limited
- . . . designed for social rather than intellectual purposes